

Claims

[c1] WHAT IS CLAIMED IS:

1. An actuating device for securing a camshaft of an engine of a motor vehicle in a start position, wherein the actuating device is configured to move the camshaft into a start position by positive control; the actuating device comprising:

a solenoid valve having a valve part configured as a pump for conveying a pressure medium;

wherein the solenoid valve has at least one pressure chamber and wherein the pressure medium is pressurized in the pressure chamber and supplied to at least one work connector of the solenoid valve;

wherein the solenoid valve is configured to convey the pressure medium by vacuum into the at least one pressure chamber.

[c2] 2. The actuating device according to claim 1, wherein the solenoid valve has a piston and a pressure element delimiting the at least one pressure chamber, wherein the piston is configured to move the pressure element for pressurizing the pressure medium in the at least one pressure chamber, when the solenoid is supplied with

current.

- [c3] 3. The actuating device according to claim 2, wherein the pressure element is configured to be elastically deformable by the piston.
- [c4] 4. The actuating device according to claim 2, wherein the at least one pressure chamber has at least one bore having a valve element configured to close the at least one bore, wherein at least one bore is configured to supply the pressure medium to the at least one pressure chamber.
- [c5] 5. The actuating device according to claim 4, wherein the valve element is lifted off the bore by applying vacuum.
- [c6] 6. The actuating device according to claim 4, wherein the valve element is elastically deformable for opening the bore.
- [c7] 7. The actuating device according to claim 1, wherein the pressure chamber has at least one supply opening comprising a first valve element for closing the supply opening and the work connector has a second valve element for closing the work connector.
- [c8] 8. The actuating device according to claim 7, wherein the first and second valve elements are arranged such that

upon pressure loading in the pressure chamber by the pressure medium the second valve element opens the work connector and upon vacuum loading in the pressure chamber the first valve element opens the supply opening.

[c9] 9. The actuating device according to claim 7, wherein the first and second valve elements are configured to be elastically deformable.

[c10] 10. The actuating device according to claim 1, wherein the pressure chamber has at least one first seal configured to seal the pressure chamber relative to at least one supply opening and at least one second seal configured to seal the pressure chamber relative to the work connector.

[c11] 11. The actuating device according to claim 10, wherein the second seal correlated with the work connector rests against a piston of the solenoid valve in a seal-tight way.

[c12] 12. The actuating device according to claim 10, wherein the first and second seals are radial shaft seals.

[c13] 13. The actuating device according to claim 10, wherein the first and second seals are arranged such that, when pressurizing the pressure medium within the pressure chamber, the second seal correlated with the work con-

nector is in a position allowing passage of the pressure medium and that, when applying vacuum within the pressure chamber, the first seal correlated with the supply opening is in a position allowing passage of the pressure medium.

- [c14] 14. The actuating device according to claim 10, wherein the solenoid valve has a piston comprising an auxiliary piston, wherein the work connector is configured to be closed off by the auxiliary piston relative to the pressure chamber.
- [c15] 15. The actuating device according to claim 14, wherein the pressure chamber has a supply opening provided with a valve element configured to close the supply opening.
- [c16] 16. The actuating device according to claim 15, wherein the valve element is configured to be elastically deformable into a position releasing the supply opening when vacuum is present in the pressure chamber.
- [c17] 17. The actuating device according to claim 14, wherein the auxiliary piston is slidably supported on the piston.
- [c18] 18. The actuating device according to claim 14, wherein the auxiliary piston is configured to move by the pressure of the pressure medium within the pressure cham-

ber against a counter force provided by at least one pressure spring.

- [c19] 19. The actuating device according to claim 14, wherein the piston is configured to move relative to the auxiliary piston against a counter force in the form of at least one pressure spring for pressurizing the pressure medium within the pressure chamber.